



Anti-Personnel Landmine Alternatives (APL-A)

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Tank-automotive & **A**rmaments **COM**mand
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Outline



- Office Overview
- Background
- Why Anti-Personnel Landmines are Needed
- Ground Rules
- Acquisition Schedule and Approach
- Non-Self Destruct Alternatives
- Fuzing Challenges
- Parting Thoughts



PROJECT MANAGER for



Mines ,

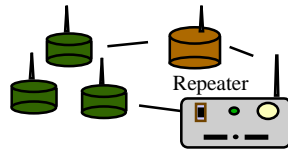
Countermine

&

Demolitions



Wide Area Munition
(Hornet)



Non-Self Destruct
Alternative



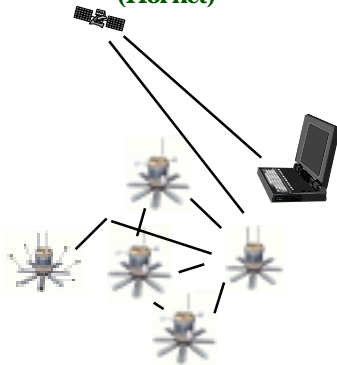
Ground STAndoff
MiNeField Detection System



Modular Crowd
Control Munition



Fighting
Position Excavator



Intelligent Combat Outpost
(RAPTOR)



RAAM/ADAM
Mixed Projectile
(RADAM)



Interim Vehicle Mounted
Mine Detector



Canister Launched
Area Denial System



Selectable Lightweight
Attack Munition



VOLCANO

**Anti-Personnel
Landmine (APL)
Alternatives**



Explosive Standoff
Minefield Clearer



Portable Vehicle
Immobilization System



Penetration
Augmented Munition

Proc (6)	1253.1m
RDT&E (18)	531.7m
Total	1784.8m

**Non-Lethal
Weapons**



Background

17 Sep 97 - POTUS Announcement

- ➡ • Develop alternatives to end use of Self-Destruct (SD) APL by 2003
 - » Retains use of “mixed” Anti-Tank/Anti-Personnel SD mine systems
- ➡ • Develop alternatives for Korea by 2006
- Increase funding for de-mining programs
- Increase efforts to establish serious negotiations in Conference on Disarmaments



Background (Cont)

DepSecDef Directive - 21 Oct 97

Objective

- Redesign, repackage and retrofit RAAM into a mixed system
- Develop and implement an alternative to the PDM
- Develop and implement alternatives to meet the requirements currently met by APLs (both non self-destructing and self-destructing), particularly in Korea

Acquisition

- Track 1: Army lead. Develop final APL requirements, and initiate an accelerated acquisition program to achieve the objectives
- Track 2: DARPA lead. Investigate maneuver denial approaches that are more innovative and that take advantage of advanced technologies



Presidential Decision Directive (PDD/NSC-64, 23 June 1998)



- Develop alternatives to end the use of all APL outside Korea by the year 2003 - date certain (Track I)
 - Retains use of mixed AP/AT SD systems
 - Develop a new mixed system called RADAM
- Aggressively pursue alternatives to APLs for Korea by 2006 - objective not a deadline
- Search aggressively for alternatives to our mixed anti-tank systems - No deadline (Track III)

“However, the U.S. will sign the Ottawa Convention by 2006, if we succeed in identifying and fielding suitable alternatives to our APL and mixed anti-tank systems by then.”



Why Do We Need APL?

- APLs act as a force multiplier
 - Deny unrestricted maneuver for enemy
 - Delay to enhance weapons effects
 - Provide alert/warning
 - Produce direct casualties
- APLs serve many roles
 - Protective obstacles
 - Protect AT minefields
 - Cover blind avenues of approach
 - Deter pursuit
 - Augment static barrier





NSD-A Ground Rules

- Cannot be AP mine - No target activation(if lethal)*
- Equivalent operational effectiveness to existing systems
- Leave residual threat no greater than existing systems
- Target discrimination capability need not be better than existing systems
 - IFF/Visual target confirmation not required
 - Rely on situational awareness
- Emphasis on fast fielding

*Anti-Personnel mine means a mine primarily designed to be exploded by the presence, proximity or contact of a person and that will incapacitate, injure or kill one or more persons.



Innovative NSD-A Acquisition Approach



- Accelerated Administrative Lead Time - Source Selection completed May '98
 - Formed Acquisition and Requirements Tiger Teams
 - Hosted Industry Day to discuss requirements and Government studies
 - White Papers evaluated on preliminary concepts
 - Government paid for proposal preparation
- Broad support in preliminary studies, evaluations and planning
 - Government Labs (ARDEC, CECOM, Night Vision Labs, Army Research Labs, Sandia, Lawrence Livermore, Joint Non-Lethal Weapons Office,)
 - Diverse User Support (Engineer School, Infantry School, USMC, US Forces in Korea, J8)
 - Analysis Contractors (MITRE Corp., Institute for Defense Analysis)
- MS II 12 months after contract award



What Is NSD-A



- Non-Self Destruct Alternative
 - Hand-Emplaced Munition Being Developed To Meet Mission Requirements Formerly Accomplished By M14 and M16 Mines.



Mines Have:



- Sensors To Detect And Locate Intrusion (Tripline or Pressure Sensors)
- Firing Circuitry To Direct Response
- Mechanism To Deliver And Provide APL Effects



NSD-A Concepts Have:

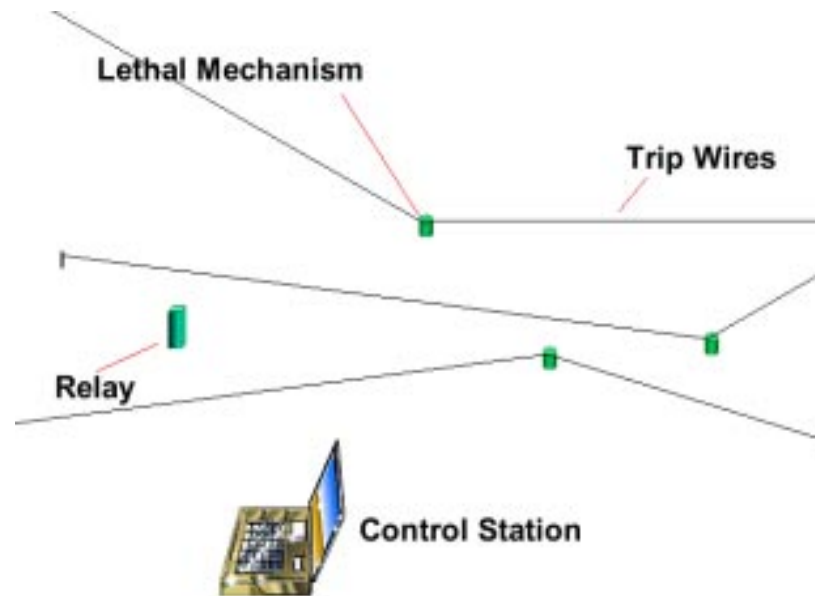


- Sensors to Detect And Locate Intrusion
- **Command & Control System to Direct Response**
- Mechanism to Deliver And Provide APL Effects

Essential Feature of Replacement Concepts is
Man-in-the-Loop



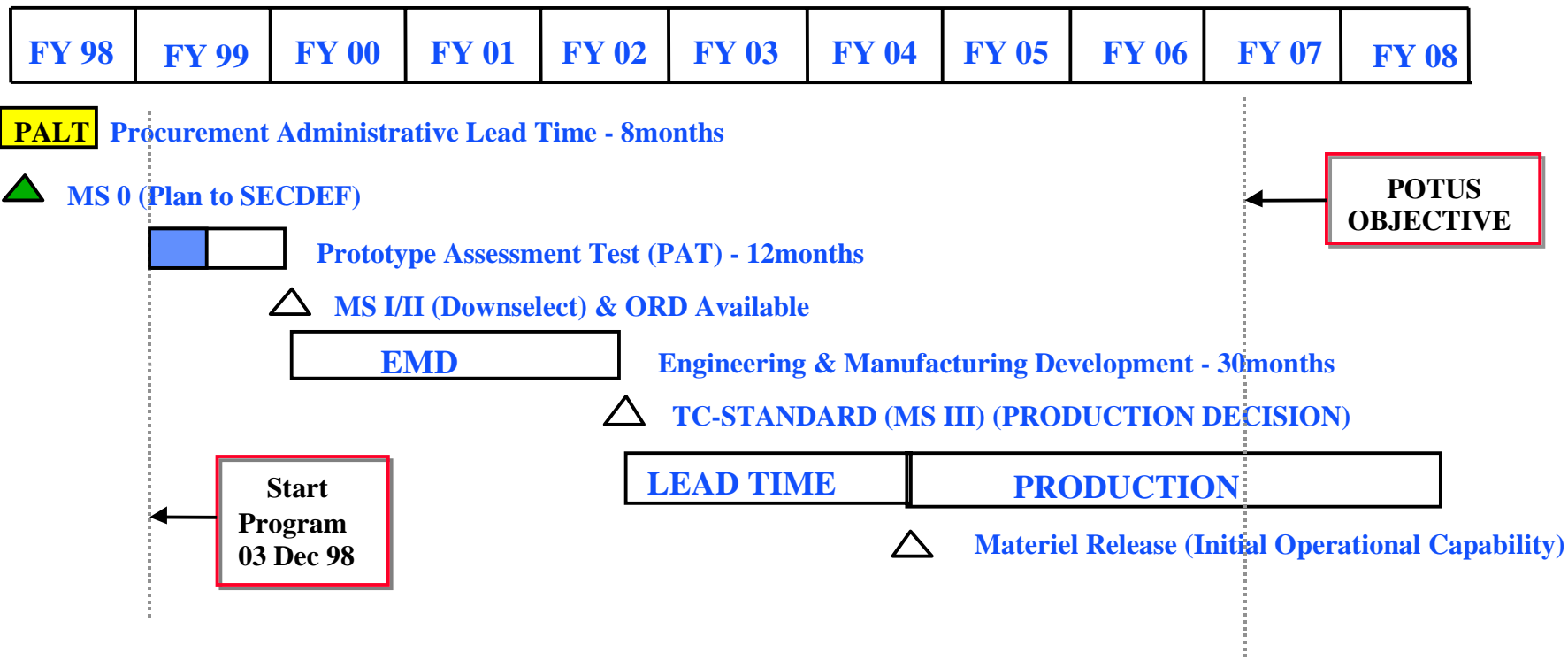
Generic NSD-A Concept





NSD -A

Program Schedule (Track 1)



NOTE: Funded through POM years



Fuzing Challenges



- ORD Requirement For Recoverability
 - Command Control through RF Transmission While Maintaining Hazardous Device Requirement of Less Than 1 per Million
- Firing Train Components In-Line
- Safety Indications Need To Be Acknowledged From A Distance



Beyond NSD-A



- Technologies being inserted into NSD-A will be essential features for future APLA systems
 - Communications with munitions
 - Recoverability
 - Control display
 - Situational awareness
- Track III (Mixed System Alternatives)
 - Expand Command & Control For Deep Deployment
 - Multiple Delivery Platforms
 - Push State of The Art On Discriminating Sensors
 - On-Off-On
- Integrate into an overall Area Denial System that will provide for Unmanned Terrain Dominance



Parting Thoughts



- NSD-A
 - On track to provide capability for USFK
 - Many Fuzing challenges - Human interface, Man-in-the-loop
- Mixed Systems Alternative
 - Many challenges ahead
 - Established OSD WIPT that will define and execute 15 month Concept Exploration Phase
- APLA programs funded through POM years